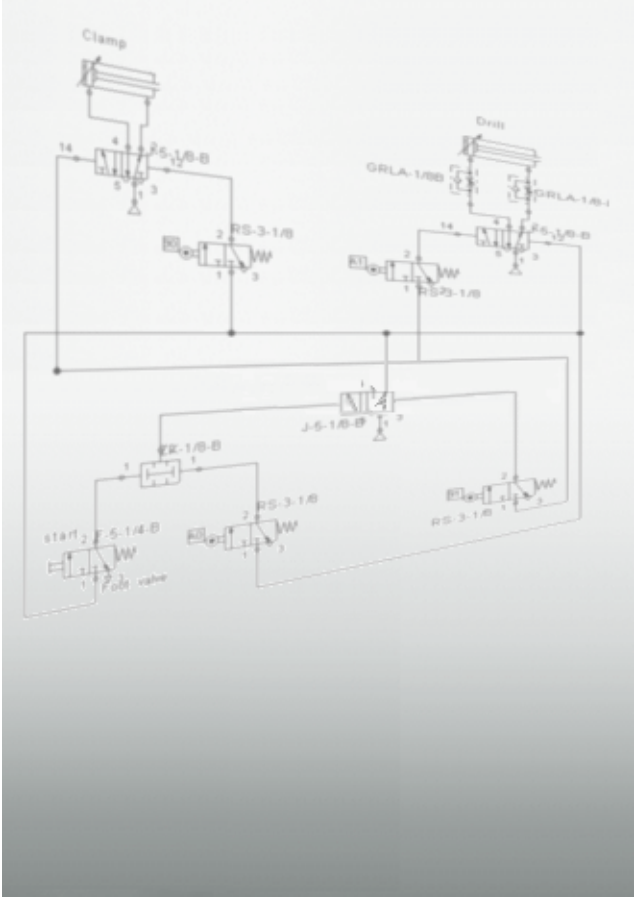
FESTO

FluidDRAW®4

User's Guide



FluidDRAW is an application for the design of pneumatic circuit drawings. If the Festo product catalogue is also installed, both component symbols and component attributes can be directly imported from there. Aside from its own file format FluidSIM supports the FluidSIM file format as well as the popular DXF file format.

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Getting Started

Chapter 1

1.1 Creating a New Circuit

⇢ Select File | New.

A blank window opens. Once you have set the drawing size, you may insert symbols and draw lines.

⇢ Select Circuit | Drawing Size...

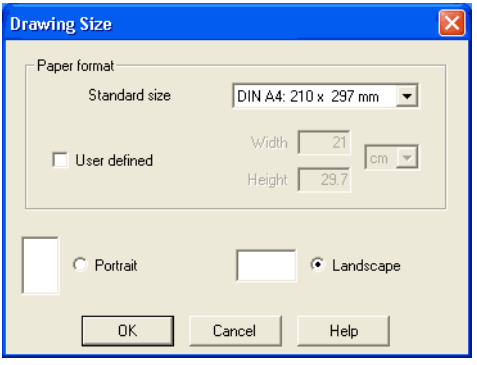

Figure 1/1: Setting the drawing size.

Select the required dimensions and format (Portrait or Landscape) for the drawing. In case the drawing size exceeds the print range of your printer, you may split the drawing and have its portions printed on several sheets (tiling). For reference purposes, you may also store additional information with the new circuit.

⇢ Select Circuit | Properties...

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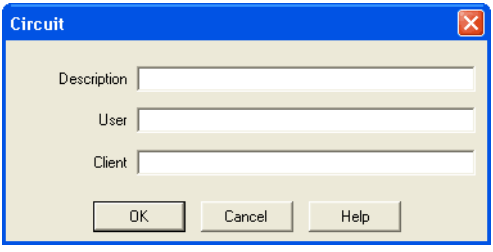

Figure 1/2: Properties dialog box for circuits.

1.2 Organizing Symbols, Libraries and Circuits

To facilitate organization of the different document types used in FluidDRAW, all circuit files are assigned to one of three groups:

Symbols

Symbols are “circuits” that contain one, and only one, component. Symbols can be inserted into circuits. To insert a symbol into a circuit, select Insert or go to the Preview window and use “drag&drop”. Both the structure of the Insert menu and the hierarchical structure of symbols, libraries, etc. in the Preview windows represent the directory hierachy on the data carrier of the `sym` directory.

Libraries

Libraries are “circuits” that contain several related or often used components. You may use them – just as symbol files – to insert symbols into your circuits. The advantage of libraries is that they allow you to quickly access symbols. To insert a symbol from a library window, use “drag&drop”. The hierarchical structure of symbols, etc. in the Preview windows represents the directory hierarchy on the data carrier of the `lib` directory.

Circuits

Circuits reside in the `ct` directory or in its subdirectories. It is recommended that you create a new subdirectory in the `ct` directory for each customer or for each project. There are Preview windows also for circuits.

1.3 Inserting a Symbol via the Menu

To find a particular symbol, you can either enter characterizing features of that symbol or navigate through the symbol hierarchy.

⇢ Open a new window, if necessary, and click on Insert / Find Component... .

A dialog comes up where a list of keywords, separated by commas or blanks, can be entered. The search is neither case-sensitive nor does it consider the keywords' order.

⇢ Enter `pressure, valve`, for instance.

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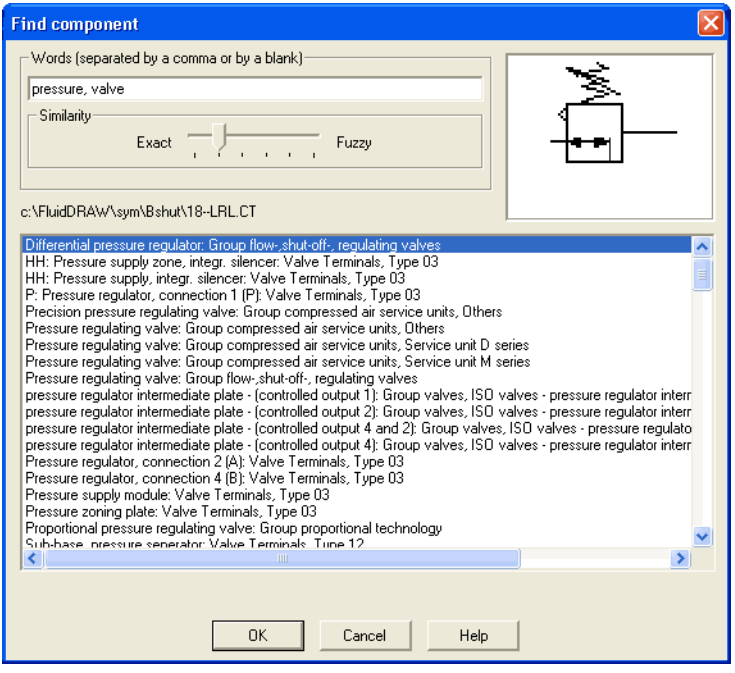
Find component
Words (separated by a comma or by a blank)
pressure, valve
Similarity
Exact
Fuzzy
c:\FluidDRAW\sym\Bshut\18--LRL.CT
Differential pressure regulator: Group flow- shut-off-, regulating valves
HH: Pressure supply zone, integr. silencer: Valve Terminals, Type 03
HH: Pressure supply, integr. silencer: Valve Terminals, Type 03
P: Pressure regulator, connection 1 (P): Valve Terminals, Type 03
Precision pressure regulating valve: Group compressed air service units, Others
Pressure regulating valve: Group compressed air service units, Others
Pressure regulating valve: Group compressed air service units, Service unit D series
Pressure regulating valve: Group compressed air service units, Service unit M series
Pressure regulating valve: Group flow-,shut-off-, regulating valves
pressure regulator intermediate plate - (controlled output 1): Group valves, ISO valves - pressure regulator interr
pressure regulator intermediate plate - (controlled output 2): Group valves, ISO valves - pressure regulator interr
pressure regulator intermediate plate - (controlled output 4 and 2): Group valves, ISO valves - pressure regulato
pressure regulator intermediate plate - (controlled output 4): Group valves, ISO valves - pressure regulator interr
Pressure regulator, connection 2 (A): Valve Terminals, Type 03
Pressure regulator, connection 4 (B): Valve Terminals, Type 03
Pressure supply module: Valve Terminals, Type 03
Pressure zoning plate: Valve Terminals, Type 03
Proportional pressure regulating valve: Group proportional technology
OK
Cancel
Help

Figure 1/3: Search Dialog.

The matching symbols are itemized in a result list, which shows the symbols in descending order according to their matching quality. A selected symbol is shown in the preview. By clicking the OK-button or by double-clicking the symbol name the symbol is entered in the drawing.
The parameter “Similarity” determines the matching tolerance, thus allowing a successful search despite of typing errors.

Aside from selecting symbols via the search dialog, you can also navigate through the symbol hierarchy.

⇢ Select Insert.

This displays the top level of the symbol hierarchy.

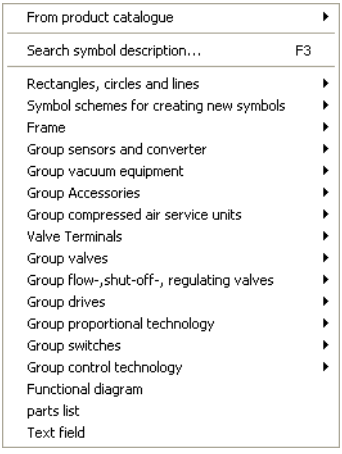

Figure 1/4: Insert menu.

⇢ Select Valve terminals

This displays another submenu with menu items, and so on. In this way, you may drill down through all menus until you have found the required symbol. To help you find any symbol more easily, each symbol is shown in the top left corner of the FluidDRAW main window.

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1.4 Inserting a Symbol from a Preview Window

⇢ Select Library | All symbols |.

This displays a window with miniature views of all available groups.

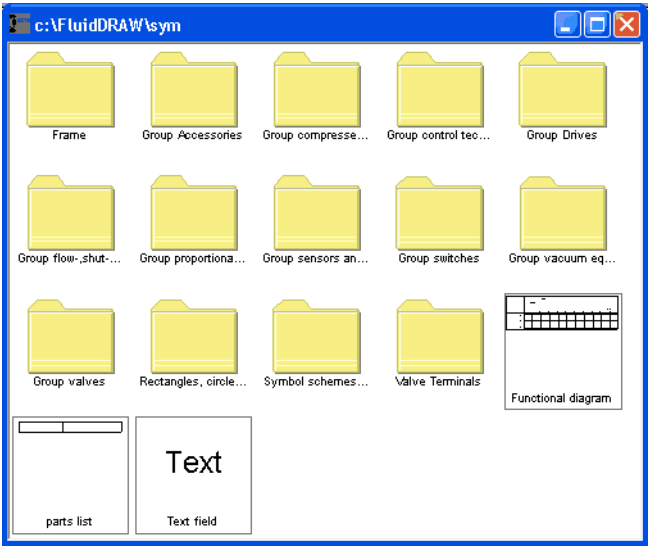

Figure 1/5: Symbol preview.

These groups correspond to the menu items of the Insert menu. When you position the cursor over a symbol, the description of that group or symbol is displayed. Where a miniature view represents a group which contains other elements, a folder symbol displays. Double-clicking a folder icon displays the next lower level of the symbol hierarchy. In this way, you may drill down to the required symbol as you would by using the Insert menu. When you have found the required symbol, you may use drag&drop to insert it into a circuit window. To return to the previous level, double-click the “level up” folder. Doing this while keeping the Ctrl key pressed returns you to the top level of the symbol hierarchy.

1.5 Structuring Symbol Files

Once you have installed FluidDRAW, you may use several hundred Festo symbols. These symbols have been logically grouped and structured by Festo. The program allows you to create new libraries as well as to add new symbols. There are basically two ways to do this:

1.5.1 Reorganizing Symbols in FluidDRAW

In order to create a new library you can use the menu instruction Library New... . After having entered a suitable description, a blank window appears on the screen and you can insert symbols into it as usual. To open this library please select the corresponding entry in the Library menu.

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1.5.2 Reorganizing Symbols via the File System

Since the structure of the Insert menu and of the Preview windows is identical to the directory structure on the data carrier, you may alternatively copy or move symbols via the File Manager or Windows Explorer. Using the File Manager or Windows Explorer also allows you to create new subdirectories to which you can copy new symbol files.

⇢ Go to the File Manager or Windows Explorer and open the FluidDRAW installation directory `FluidDRAW`.

Apart from other subdirectories, you will see the `sym` directory, which contains (other subdirectories with) the symbol files.

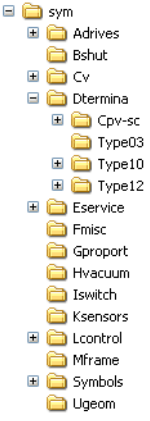

Figure 1/6: Excerpt from the symbol directory on the data carrier.

When you create new directories or copy symbols, FluidDRAW automatically recreates (reorganizes) the Insert menu and the Circuit previews accordingly next time you start the program.

1.6 Library Files

To be able to quickly access often used symbols, you may want to group symbols into symbol libraries. A symbol library is basically a “circuit” with unrelated symbols, which are conveniently grouped.

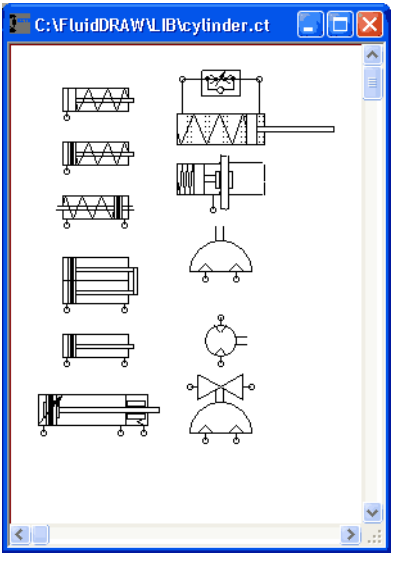

Figure 1/7: Symbol library with pneumatic drives.

You may easily create library files by opening a new circuit window and inserting the required symbols (via the Insert menu or from the Symbol Previews). To facilitate organization and management of the library files, save them to the `lib` subdirectory of the FluidDRAW installation directory `FluidDRAW`. As for symbol files, you may open a window with miniature views for each library file. To do so, select Frequently used symbols from the Library menu.

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1.7 Circuit Files

Just like symbols and libraries, circuits are files that contain pneumatic components. In contrast to symbols and libraries, however, circuits consist of logically connected components rather than just of logically grouped symbols; these logically connected components represent a particular function. Technically, though, the only difference is that the circuits reside in the `ct` directory of the FluidDRAW directory (or in other subdirectories of that directory). Similar to symbol and library files, circuit files can be reorganized in FluidDRAW or on the data carrier. You may display miniature views of circuits in Preview windows by selecting Circuit Preview from the File menu.

Editing Circuits

Chapter 2

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2.1 Inserting and Organizing Symbols

To insert symbols into the window with the circuit to be edited, use the Insert menu and the Preview windows. You may also take objects from every other window by selecting the required components and dragging them to the target window. Alternatively, you may use the clipboard: Select the objects, then select Edit | Copy, activate the target window (i.e. move it to the foreground so that it becomes the current window), and finally select Edit | Paste.

Using “drag&drop” between windows copies the objects from one window to the other. Using drag&drop within a window moves the objects to the new position. To copy an object within a window, keep the Shift key pressed while dragging the object to the new position. Note how the cursor changes: When you move an object, the cursor becomes a cross-hair pointer with arrowheads , when you copy an object, a plus sign displays at the bottom right corner of the cross-hair pointer . Symbols with connections are automatically aligned such that the connections are located on a grid. This facilitates drawing lines.

2.2 Drawing a Line between Connections

To connect two components via a line, move the cursor to one of the connections. You will recognize a connection by the small circle at the end of the symbol's internal connection line. When you "position" the cursor over a connection, it becomes a cross-hair pointer ⌖.

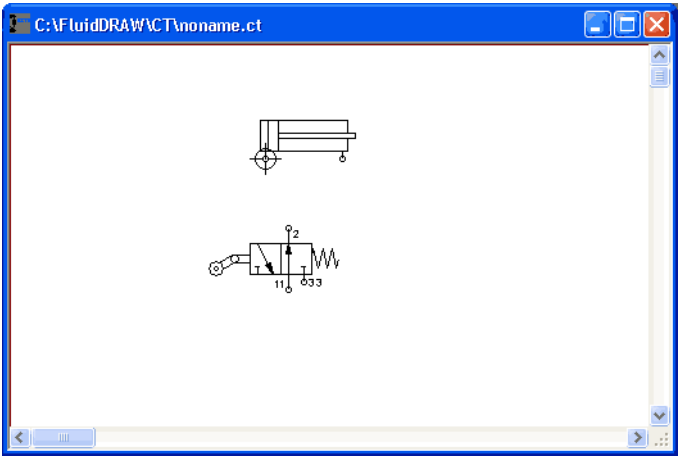

Figure 2/1: Cursor positioned over a component connection.

⇢ Press the left mouse button and move the cursor to the connection which you want to link to the first connection.

Again, note the mouse pointer ⌖. It changes when you position the cursor over a connection. When you position the cursor over a connection that has already been linked to another connection, a prohibitive sign ⊘ displays. This means that you are not allowed to draw another line.

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⇢ Release the mouse button when the cursor is positioned over the second connection.

FluidDRAW automatically draws a line between the two connections.

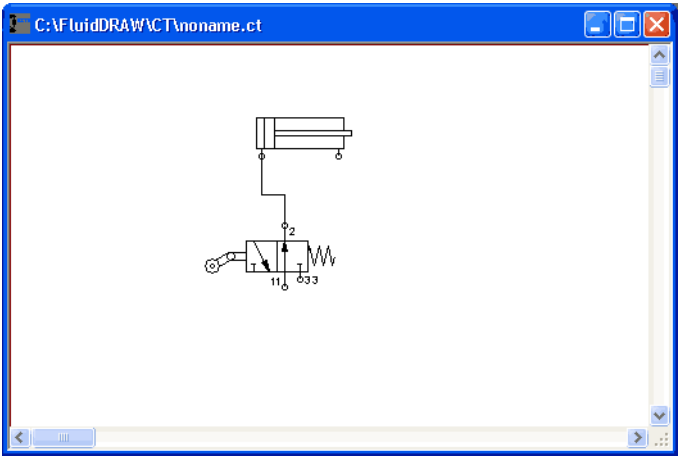

Figure 2/2: Line between two connections.

2.3 Inserting a T-Connection

FluidDRAW places a T-connection automatically, if a component connection is moved by drag-and-drop on a line, or vice versa, if a line is moved onto a connection. The connection of two lines can happen in the same way, by dragging one onto the other: FluidDRAW places two T-connections and connects them by an additional line.

⇢ Move the cursor to a connection and press the left mouse button.

When you position the cursor over a line segment, it becomes a cross-hair pointer ⌖.

⇢ Release the mouse button when the cursor is positioned over the desired point of the line.

FluidDRAW automatically inserts a T-connection and draws a line.

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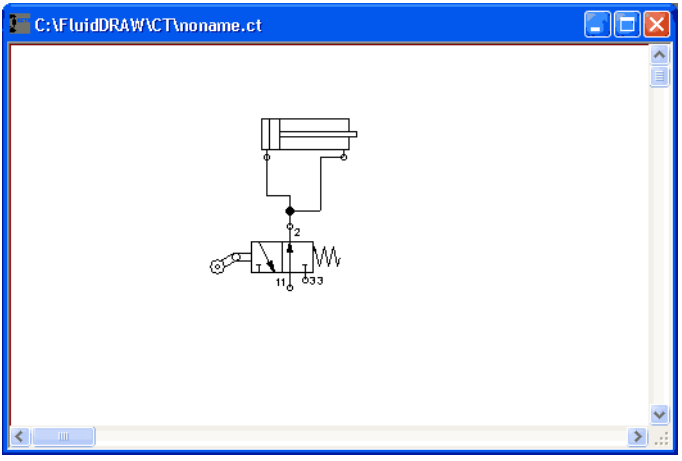

Figure 2/3: Connecting lines via a T-connection.

You can connect up to 4 lines with every T-connection.

2.4 Drawing Lines

After drawing a line between two connections you may want to adjust the position of the lines. You may move horizontal lines vertically, and vertical lines horizontally, by positioning the cursor over the line segment to be moved. Once the cursor is correctly positioned over the line segment, it becomes a “double-lined cross” ⧾.

⇢ Press the left mouse button and move the line segment orthogonally to the required position.

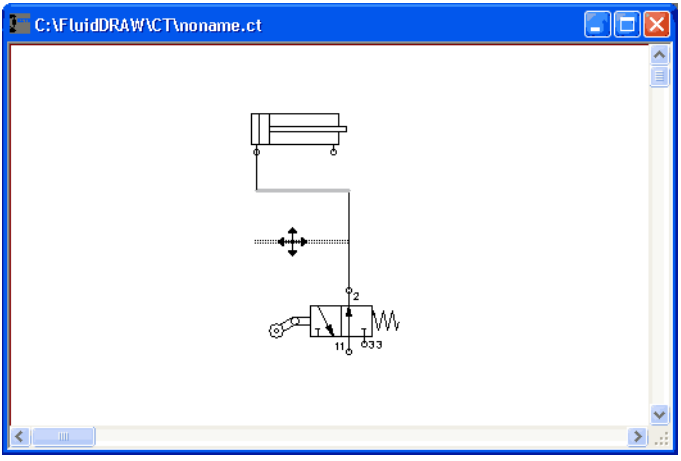

Figure 2/4: Moving a line segment.

⇢ Release the mouse button; FluidDRAW automatically adjusts the line segments to create a continuous line.

When you move a line segment that is directly connected to a component connection, FluidDRAW may insert additional line segments to prevent gaps.

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2.5 Determining the Line style and Color

You may determine the pneumatic line style, color and drawing layer by double-clicking a line segment, or by selecting a line segment and calling the Properties dialog box by selecting Edit | Properties....

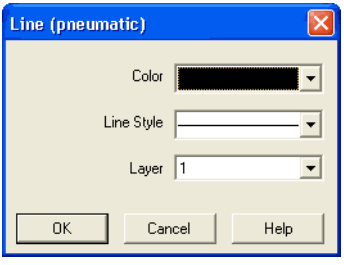

Figure 2/5: Properties dialog box for pneumatic lines.

Main lines are typically depicted as “continuous” lines while control lines are depicted as “dashed” lines.

2.6 Deleting Lines

There are two ways to delete a line: You may select (mark) a line segment and either press Del or select Edit | Delete. Alternatively, you may select a component connection and "delete" it. Note that both actions delete the line rather than the connection.

When you delete a T-connection to which *three* or *four* lines are connected, all lines are deleted. If only *two* lines are connected to the T-connection, however, the T-connection is deleted while the two lines are linked to become one line.

2.7 Closing a Connection with a Blind Plug or an Exhaust

You may close (shut up) a component connection with a blind plug or terminate it with an exhaust by double-clicking the connection or by selecting Edit | Properties... to display the Properties dialog box for connections.

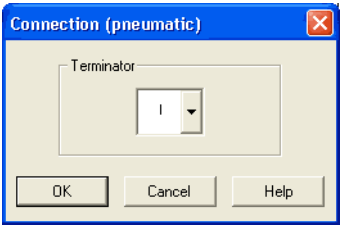

Figure 2/6: Properties dialog box for connections.

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Choose from the symbol list a suitable exhaust or the blind plug. Note that this option is only available as long as no line is connected to the connection. If you want to draw a line to a closed connection, you must first remove the blind plug and the exhaust, respectively.

2.8 Defining Component Connections

To define a new component connection, select Edit Define Connection. This causes FluidDRAW to automatically switch to a special mode in which a new connection is created wherever you click. When you want to return to normal mode, press Esc. FluidDRAW creates connections exactly at the end of a line, it is therefore recommended that you magnify the symbol as much as possible. As soon as the cursor is positioned over a valid line end, it becomes a cross-hair pointer ⌖. Press the left mouse button to create the new connection.

2.9 Deleting a Component Connection

To delete a component connection, mark it and select Edit Delete Connection. Note that Delete or pressing Del only deletes a line, if any, while the connection itself is not deleted.

2.10 Configuring Way Valves

In case you should need a particular valve that you do not find in the FluidDRAW standard libraries, you can build own valves by using the valve editor.

⇢ Insert under “Insert / Symbol schemes for creating new symbols / Configurable way valves” a “4/n Way valve” into a circuit window.

To determine the valve bodies and the operating methods of way valves make a double-click on the valve. The property dialog of the component opens. In the upper section of it you will find the button “Configure Valve...”. Press this button in order to open the valve editor.

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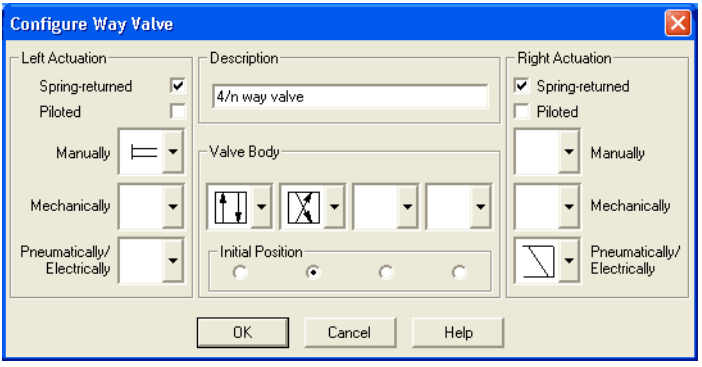

Figure 2/7: Valve editor.

Left/Right Actuation

For both sides the actuation modes of the valve can be defined individually; it can be one or more of the categories “manual”, “mechanical”, or “pneumatic/electrical”. An operation mode is set by clicking on the down-arrow at the right-hand side of the list and selecting a symbol. If for a category no operation mode is desired, simply choose the blank symbol from the list. Moreover, for each side of the valve the attributes “spring-returned” and “piloted” can be set.

Designation

Enter here a name for the valve.

Valve Body

A configurable valve has at most four positions. For each of the positions a valve body element can be chosen individually. Such an element is set by clicking on the down-arrow at the right-hand side of the list and selecting a symbol. If for a position no element is desired, simply choose the blank symbol from the list.

Initial Position

This button defines the valve’s initial position (sometimes also called normal position or neutral position), which is the position without having any operation applied to the valve. Note that this setting is only exploited if it physically does not contradict a spring-returned setting, possibly defined above.

2.11 Aligning Symbols

To align objects, mark the objects and select the appropriate option or options from the Edit menu. Note that symbols with connections are automatically aligned to the grid which is why aligning might prove difficult.

2.12 Grouping Symbols

To combine symbols into a group, mark the objects and select Group from the Edit menu. You may also create subgroups (nesting) for objects that have already been grouped.
Note that only the parent group (but not any subgroups) is represented as “component symbol”, and only this group’s properties are displayed in the parts list. This allows you to combine partial circuits from several components into one object.

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2.13 Ungrouping Symbol Groups

To ungroup a group, mark the group and select Ungroup from the Edit menu. This ungroups only the parent group. To ungroup subgroups, you must select Ungroup repeatedly for all levels until you have arrived at the final subgroup you want to ungroup.

2.14 Rotating and Mirroring Symbols

Component symbols can be rotated in steps of 90 degrees, and mirrored horizontally and vertically. To do so, select the appropriate option or options from the Edit menu. FluidDRAW ensures that all line segments are rotated or mirrored correspondingly. When you have selected several objects, they are rotated or mirrored one after the other. If you want one common rotation or mirror axis, you should group the objects beforehand. Instead of using a menu command to rotate objects, you may want to rotate them by double-clicking the symbol while keeping the Ctrl key pressed.

Additional Support for Creating Circuits

Chapter 3

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3.1 Drawing Grid

When organizing symbols and drawing lines, it is often useful to have a grid of dotted or continuous lines in the background. To show or hide the grid, select View | Display Grid. Use Options | Grid... to set other grid parameters.

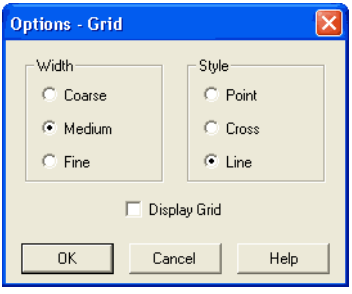

Figure 3/1: Grid options.

3.2 Drawing Layers

FluidDRAW provides eight drawing layers each of which can be masked and locked. Moreover, each drawing layer has its own line width, which is primarily used for printing purposes, but which can also be used for the screen via Display Line Width. The properties of the drawing layers as well as a layer name are defined via View Layers....

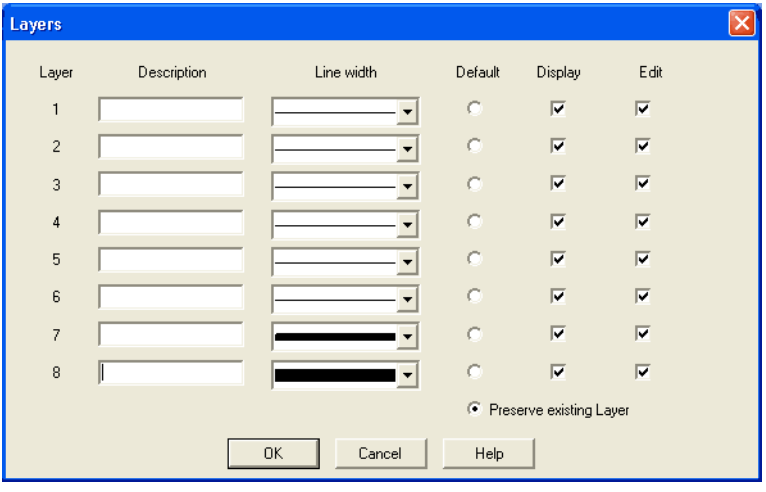

Figure 3/2: Properties dialog box for drawing layers.

By the “Default” setting, the drawing layer for newly inserted symbols is predefined. If the current drawing layer shall not be changed when a new symbol is inserted, the option “Preserve existing layer” must be selected.

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When the “Edit” option is not active for a layer, the objects on that layer are visible, but you cannot select and consequently not move or delete them. You can, however, draw a e. g. frame. To make these objects available to editing, temporarily activate the Edit option for the corresponding layer.

When the “Display” option is not active for a layer, the objects on that layer are not visible and cannot be edited.

3.3 Graphic Elements

3.3.1 Squares/Rectangles

Squares and rectangles are available in addition to component symbols. To open the Properties dialog box for rectangles, double-click a rectangle or select Edit | Properties... .

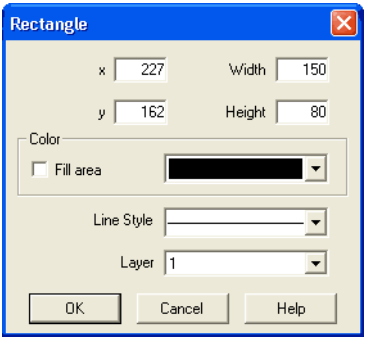

Figure 3/3: Properties dialog box for rectangles.

x	Determines the x-coordinate (x-axis) for the rectangle. Instead of entering a value, you may want to move the rectangle using the mouse.
y	Determines the y-coordinate (y-axis) for the rectangle. Instead of entering a value, you may want to move the rectangle using the mouse.
Width	Determines the width of the rectangle. Instead of entering a value, you may want to use the mouse to enlarge or reduce the rectangle. When you position the cursor over the edge of the rectangle, it becomes an icon depicting the direction for a change: ↔, ↕ or ↖↘. To enlarge or reduce the rectangle in the shown direction, keep the left mouse button pressed and move the cursor accordingly.
Height	Determines the height of the rectangle. Instead of entering a value, you may want to use the mouse to enlarge or reduce the rectangle. When you position the cursor over the edge of the rectangle, it becomes an icon depicting the direction for a change: ↔, ↕ or ↖↘. To enlarge or reduce the rectangle in the shown direction, keep the left mouse button pressed and move the cursor accordingly.
Color	Determines the color of the rectangle's frame. To set the color, click the Down arrow to the right of the list, and select a color.
Fill Area	Defines whether the entire rectangle or only its border is to be colored.
Line Style	Determines the line style of the rectangle's frame. To set the line style, click the Down arrow to the right of the list, and select a line style.
Layer	Use this selection list to select the drawing layer for the rectangle. To set the drawing layer, click the Down arrow to the right of the list, and select a layer.

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Depending on the drawing layer settings, the rectangle may not be shown, or it may not be possible to edit it. To show the object or to be able to change the settings, temporarily activate the drawing layer via View | Layers... .

3.3.2 Circles/Ellipses

Circles and ellipses are available in addition to component symbols. To open the Properties dialog box for ellipses, double-click an ellipse or select Edit | Properties... .

Figure 3/4: Properties dialog box for ellipses.

Center x — Determines the x-coordinate (x-axis) of the center. Instead of entering a value, you may want to move the ellipse using the mouse.

Center y — Determines the y-coordinate (y-axis) of the center. Instead of entering a value, you may want to move the ellipse using the mouse.

Radius rx	Determines the x-radius of the ellipse. Instead of entering a value, you may want to use the mouse to enlarge or reduce the ellipse. When you position the cursor over the edge of the ellipse, it becomes an icon depicting the direction for a change: ↔, ↕ or ↖↘. To enlarge or reduce the ellipse in the shown direction, keep the left mouse button pressed and move the cursor accordingly.
Radius ry	Determines the y-radius of the ellipse. Instead of entering a value, you may want to use the mouse to enlarge or reduce the ellipse. When you position the cursor over the edge of the ellipse, it becomes an icon depicting the direction for a change: ↔, ↕ or ↖↘. To enlarge or reduce the ellipse in the shown direction, keep the left mouse button pressed and move the cursor accordingly.
Starting Angle	Determines the starting angle (degrees) for the ellipse. 0 degrees correspond to the position of the hands of a clock when it is “3 o’clock”.
Ending Angle	Determines the ending angle (degrees) for the ellipse. 0 degrees correspond to the position of the hands of a clock when it is “3 o’clock”.
Color	Determines the color of the ellipse’s frame. To set the color, click the Down arrow to the right of the list, and select a color.
Fill Area	Defines whether the entire ellipse or only its border is to be colored.
Line Style	Determines the line style of the ellipse’s frame. To set the line style, click the Down arrow to the right of the list, and select a line style.
Layer	Use this selection list to select the drawing layer for the ellipse. To set the drawing layer, click the Down arrow to the right of the list, and select a layer.

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Depending on the drawing layer settings, the ellipse may not be shown, or it may not be possible to edit it. To show the object or to be able to change the settings, temporarily activate the drawing layer via View | Layers....

3.4 Checking Your Drawing

To have FluidDRAW check your drawing for drawing defects, select Circuit | Check Superficially. FluidDRAW issues a warning if

- objects located outside the drawing area
- a line intersects a component;
- a line intersects a connection to which it is not connected;
- a line is placed over another line;
- a component is placed over another component;
- a connection is open.

When a warning displays and you click OK, the objects in question are displayed highlighted.

Using the Festo Product Catalogue with FluidDRAW

Chapter 4

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With the product catalogue installed, you may insert symbols from the product catalogue as well as find component attributes of FluidDRAW symbols in the product catalogue. If the product catalogue is not installed, you may still create circuits and save them in a file. You may update component attributes and parts lists later, after installing the product catalogue. There are two ways to insert symbols into circuits:

Via the FluidDRAW Insert menu or from FluidDRAW Preview windows

By inserting symbols from FluidDRAW symbol libraries, you determine nothing more than the symbol to be used in your drawing. Most symbols, however, represent many different components with different attributes and parameters which is why the part numbers are not uniquely defined. You may specify the symbols later in detail. To do so, open the Properties dialog box for the component and select “Load from product catalogue...”.

Via the Festo product catalogue

The product catalogue is a complete database that contains all available Festo components. You may select parameters in each search dialog until you arrive at a unique part number. Each part number corresponds to a symbol. So when you exit the product catalogue, FluidDRAW automatically inserts the correct symbol into your circuit.
To insert a symbol for a component from the product catalogue, select Insert | From product catalogue / Quick search... and From product catalogue / Component properties..., respectively. This displays a window with the product catalogue from which you can select a component.

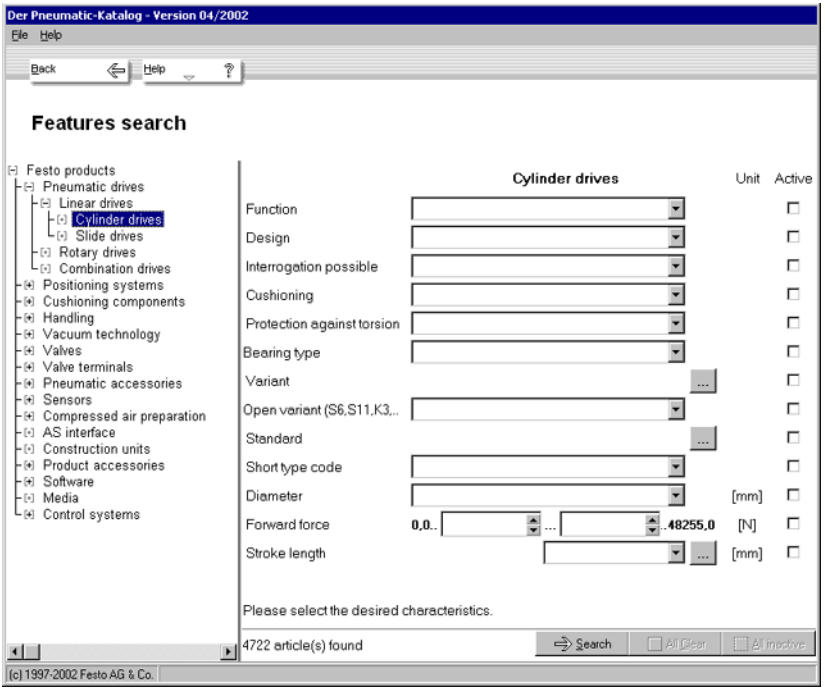

Figure 4/1: Festo product catalogue.

If you would like to insert a symbol from an already existing order list please choose the entry From product catalogue / Order list... in the menu Insert. If you choose components which are not defined by a symbol, a text appears in the circuit diagram. It represents the component attributes instead of the symbol. This text as well as the symbol attributes appear in the parts list.

Under Options Product catalogue... you can install settings which influence the generation of symbol definitions and components.

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4.1 Options for the use of the product catalogue

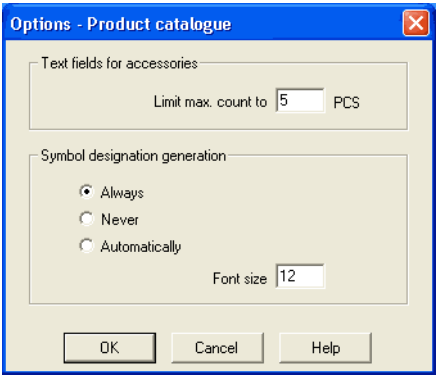

Figure 4/2: Options – Product catalogue.

Limit max. count to.. PCS

If you adopt components from the product catalogue which are not defined by a symbol, FluidDRAW automatically creates text elements with the corresponding component attribute. Sometimes, however, it is not desirable to generate a text element for every single component part, because the clear arrangement may be lost quickly. With an appropriate entry you can limit the number of the created text elements in a reasonable way.

Symbol designation generation

Optionally, FluidDRAW creates automatically text components which are based on the type-information of the corresponding symbol. Select “Always” if you would like the program to generate such symbol attributes in general. If you do not want to have symbol attributes in any case, please select “Never”. The option “Automatically” considers the last setting you have effected in “Adopt from type” in property dialog of components.

Component Attributes

Chapter 5

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5.1 Component Attributes in the Properties Dialog Box

The FluidDRAW symbols correspond largely to the components in the Festo product catalogue. With the product catalogue installed, FluidDRAW retrieves most component attributes from the product database. If the product catalogue is not installed, you may still create circuits, and add the missing attributes later. Double-click a symbol or select Edit Properties... to open the Properties dialog box for the component.

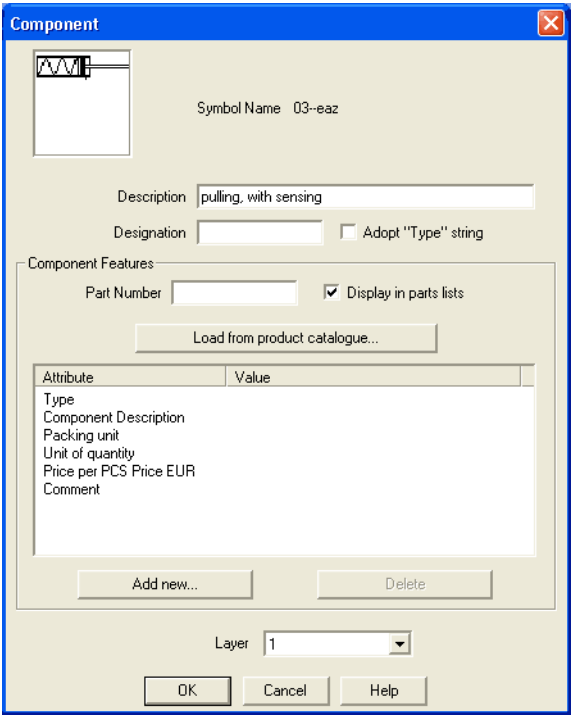

Figure 5/1: Properties dialog box for a component.

Symbol Name	The symbol name links a symbol to the Festo product catalogue as long as the symbol is selected from the Fluid-DRAW symbol library or via the Insert menu. In this case, the correct part number remains to be determined since any one symbol represents many part numbers. The symbol name is display-only, it cannot be maintained.
Description	The “Description” text field may contain a description or the complete name of the symbol.
Designation	This designation equals the symbol designation in the circuit and is automatically retrieved. It is also contained in parts lists. If a text is placed close to symbol, this text is used as the symbol’s description. Given the case that this description is only a partial description, or if the parts lists shall contain a different text, use the adjoining description field for these purposes. If by now no description is associated with this component, a text is automatically generated. The position of this text can be changed subsequently. Note that an automatically generated text is moved together with the component. In many cases it is reasonable to use the symbol type as description. If a symbol’s properties are determined, either via the product catalogue or manually, the respective text can be used as description. For this the option “Adopt Type string” must be enabled.
Part Number	The part number uniquely identifies a part or component. You may enter the part number manually or retrieve it from the product catalogue.
Display in parts lists	Deactivate this option if you do not want the symbol to be displayed in the parts lists.

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Load from product catalogue...	By clicking on this button you get the components attributes from the product catalogue. If a part number for the symbol was already fixed, the attribute dialog appears directly or, if this was not the case, you will be first of all requested to specify the symbol closer over the product catalogue.
Attribute list	Here you can enter the component attributes yourself or you can change the data adopted from the product catalogue. If you click once more on “Load from product catalogue...”, your entries will be replaced again by the data loaded from product catalogue. In order to change an attribute value make a double-click on the corresponding value in the right column.
Add new...	You can add any own attributes you like by using the button Add new.... Following to that please enter a new attribute designation and maybe a value. In order to facilitate the entry as far as often used attributes are concerned, FluidDRAW stores the last attribute descriptions you have entered. These can be chosen from the list so that it is not necessary to enter them again and again.
Delete	Deletes the marked attribute from the attribute list.
Layer	Use this selection list to select the drawing layer for the symbol. To set the drawing layer, click the Down arrow to the right of the list, and select a layer. Depending on the drawing layer settings, the symbol may not be shown, or it may not be possible to edit it. To show the symbol or to be able to change the settings, temporarily activate the drawing layer via View Layers... .

5.2 Attributes of Text Components

In FluidDRAW, text components are used to insert comments and descriptions as well as to define symbol descriptions and accessories which are not represented by a symbol. To open the Properties dialog box for a text component, double-click the text or select Edit | Properties... .

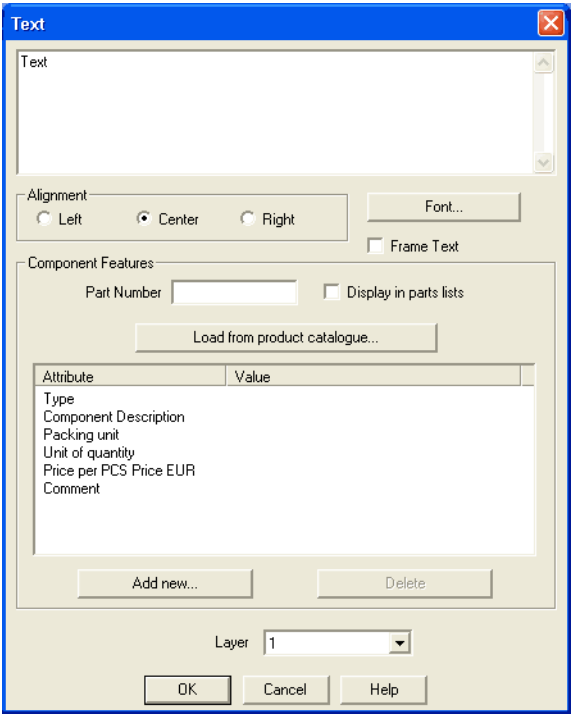

Figure 5/2: Properties dialog box for a text component.

Text

Use this text field to enter your text. To produce a line break when entering several lines of text, keep the Ctrl key pressed while pressing ENTER.

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Alignment	Determines the horizontal alignment of the text.
Font...	Use this button to set the font and color.
Frame Text	Draws a frame around the whole text.
Part Number	The part number uniquely identifies a part or component. You may enter the part number manually or retrieve it from the product catalogue.
Display in parts lists	Deactivate this option if you do not want the symbol to be displayed in the parts lists.
Load from product catalogue...	By clicking on this button you get the components attributes from the product catalogue. If a part number for the symbol was already fixed, the attribute dialog appears directly or, if this was not the case, you will be first of all requested to specify the symbol closer over the product catalogue.
Attribute list	Here you can enter the component attributes yourself or you can change the data adopted from the product catalogue. If you click once more on “Load from product catalogue...”, your entries will be replaced again by the data loaded from product catalogue. In order to change an attribute value make a double-click on the corresponding value in the right column.
Add new...	You can add any own attributes you like by using the button Add new.... Following to that please enter a new attribute designation and maybe a value. In order to facilitate the entry as far as often used attributes are concerned, FluidDRAW stores the last attribute descriptions you have entered. These can be chosen from the list so that it is not necessary to enter them again and again.
Delete	Deletes the marked attribute from the attribute list.

Layer	Use this selection list to select the drawing layer for the text. To set the drawing layer, click the Down arrow to the right of the list, and select a layer.

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Maintaining Parts Lists

Chapter 6

6.1 Inserting a Parts List

You may set up FluidDRAW to have parts lists created automatically. To do so, use the appropriate “parts list component”, which you can e. g. insert, move or delete just like any other symbol. The parts list is updated automatically while you edit a drawing. Since the columns that are displayed depend on the components at the time you insert the parts list, it is recommended that you insert the parts list component as late as possible into your drawing.

⇢ Use the Insert menu or the Symbol Preview window to find the parts list component, and insert it into your drawing (circuit).

When you insert a parts list, the program checks the existing components for attributes and creates a table with columns for attributes and rows for components. You may adjust the form and contents of the parts list to your requirements and export it as a text file. You may also set the parts list to list the components of all circuit files for a project.

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6.2 Setting Parts List Properties

⇢ Double-click a parts list, or mark the parts list and select Properties... from the Edit menu.

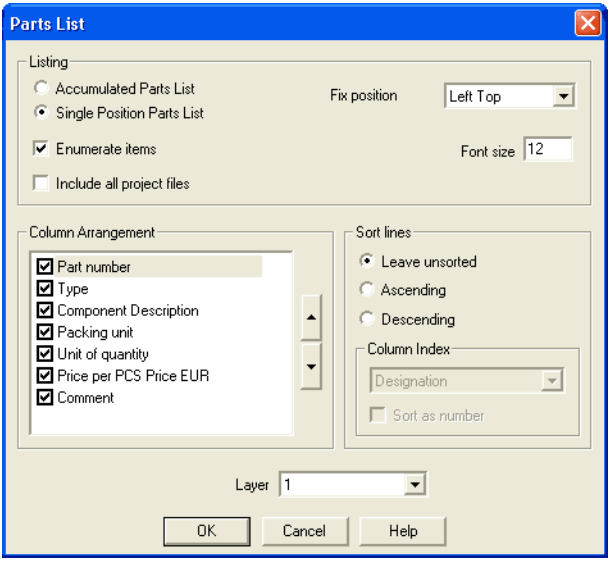

Figure 6/1: Properties dialog for parts list.

Parts List

To have all components with the same attributes grouped together, activate the “Accumulated Parts List” option. This will display the number of components of a row in the first column of the parts list.
To have all components listed individually, activate the “Single Position Parts List” option. This will display the symbol descriptions, if any, in the first column.
If the option “Enumerate items” is activated, a serial number appears in the first column of the parts list.

	When the “Include all project files” option is active, the system lists the components from all files which belong to the open project. Note that this function takes some time to complete when the parts list is being updated. It is therefore recommended that you don’t activate this option until you actually need the correct contents of the parts list.
Fix Position	Depending on the parts list’s position in a drawing, preferred directions for its enlargement exist when new symbols are added. E.g. it could make sense that the parts list grows only upward or to the left. In the selection list a suited anchor point can be set.
Font size	Please enter here the requested font size.
Column Arrangement	In this list you can adjust the order of the columns for the component attributes. Move the attributes into the requested order by using the arrow buttons on the right next to the list. If you do not want the column to appear in the partslist, please remove the hook on the left side of the attribute.
Sort lines	You may choose if and how you want the contents of the parts list sorted. If the “Ascending” or “Descending” option is active, you may enter the number of the column to be sorted under “Column Index”.
Sort as number	Defines the sorting concept for numbers that occur in the parts list. A normal, say, lexicographical sorting would list, for instance, the “11” before the “2”. However, having the Sort-as-Number-option enabled, the numbers’ numerical value defines their position.
Layer	You may determine the drawing layer on which you want to insert the parts list by selecting it from the selection list.

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Managing Projects

Chapter 7

FluidDRAW allows you to include various settings and files in a project file with a unique name, thereby facilitating project management. When you open a project, the previously saved project settings default. The Project menu allows you to quickly access files that belong to a particular project. Projects also allow you to maintain parts lists whose elements belong to different circuits.

7.1 Creating a New Project

Before you create a new project you may take some preparatory actions to facilitate project management and to save you several process steps at a later stage.

⇢ Open all files that you want to add to the project to be created. This includes e. g. Preview windows for often used symbols and libraries as well as circuit files, if any.

All files which are open when you create a project will be automatically added to the project.

⇢ Select Project New... and enter a file name for the new project.

Project files have the extension `prj` and should, for best results, reside in the same `ct` subdirectory as the circuit files for the project.

When you exit the dialog box after entering the file name, the system creates the project file with the open files.

⇢ Close all windows which you don't need right now, and arrange the remaining windows according to your preferences.

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You may open any closed windows that belong to the project at any time by selecting Circuit diagrams or Component libraries from the Project menu.

⇢ Save the settings and the window arrangement as default for this project by selecting Options Save Settings Now.

7.2 Entering Project Properties

To enter project data, select Properties... from the Project menu. Any text you enter into the `Description` field will be displayed in the status line of the main window while this project is open.

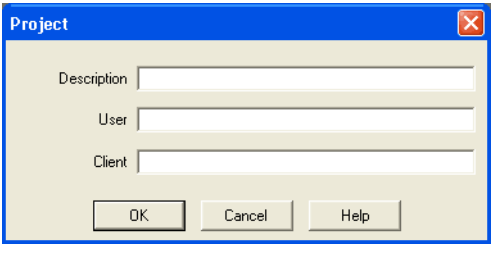

Figure 7/1: Properties dialog box for projects.

7.3 Adding Files to a Project

To add new symbol, library or circuit files to a project, open or activate the appropriate window, then select Add current window from the Project menu. Depending on whether the window is a circuit file or a Preview window, it is automatically added to Circuit diagrams or Component libraries, respectively.

7.4 Removing Files from a Project

To remove symbol, library or circuit files from a project, open or activate the appropriate window, then select Delete current window from the Project menu.

7.5 Opening Project Files

To open the files and previews (overviews) for a project, go to the Project menu and select Circuit diagrams or Component libraries, whatever is appropriate. Alternatively, you may open the files by selecting Open... from the File menu or by selecting them from the list of files that were last maintained, by selecting them from Preview windows or by using drag&drop in the File Manager or Windows Explorer.

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Circuit Input and Output

Chapter 8

8.1 Printing a Circuit

To print FluidDRAW circuits, select File Print....

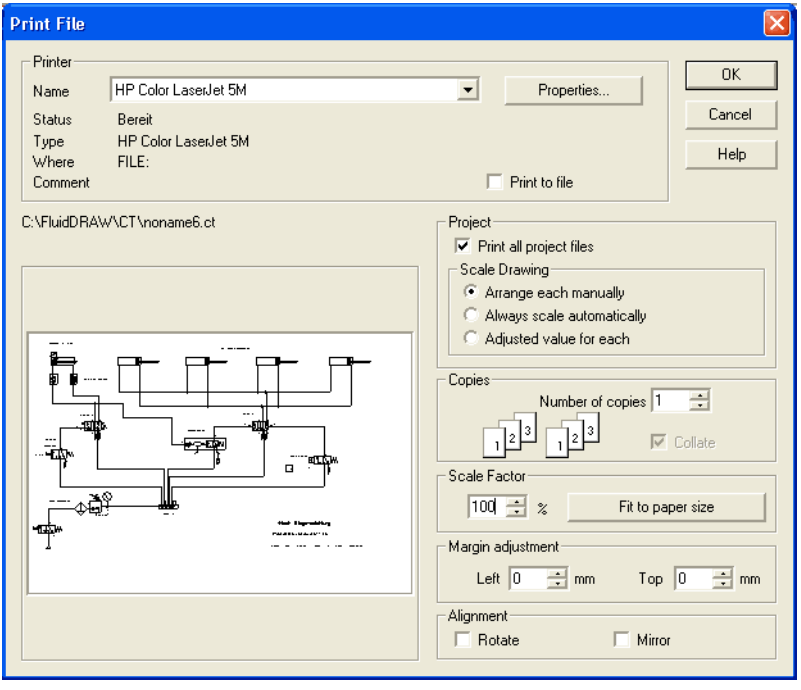

Figure 8/1: Print dialog.

Printer	Choose the requested output device from the list of available printers.
Properties...	Use this button to open the Print Setup dialog box.
Print to file	Activate this option if you would like to write the print data into a file.

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Project	If the drawing that is to be printed a part of a larger project, additional options for the printout of all drawings of the project are at hand. It can be chosen whether each drawing is adapted individually, or if the drawings are scaled automatically by FluidDRAW, or if the predefined settings shall be applied to all drawings. Having chosen the manual setting, a print dialog is opened for each print file, and corrections respecting the scaling or other settings can be made. If the drawings are scaled automatically by FluidDRAW, the drawing is scaled such that it fits entirely on the paper. The third possibility applies the settings from the printer dialog to all drawings.
Copies	Choose the number of copies you would like to print. If the printout consists of several pages, you can instruct FluidDRAW to collate the papers.
Scale factor	You may enlarge or reduce the circuit to be printed by either entering a scale factor (scaling factor) or by selecting it via the Up or Down arrow. If the dimensions of the range to be printed exceed the range that can be printed on paper, the drawing will be split and its portions printed on several sheets (tiling). Check the preview to see how a circuit will actually be printed on several pages. Note that the margins might not come out exactly as you expect them to, it is therefore recommended that you dimension your drawing such that it will fit on the paper in any case.
Margin adjustment	In order to take the printable regions of different output devices into account, or enlarge the margin of a printout, an offset in mm can be defined for the left as well as the upper margin. Positive values move the drawing to the right or down, negative values move the drawing to the left or up.

Alignment

If you like you can mirror the complete drawing or rotate it by 90 degrees. Use these options if your output device resp. the printer driver does not support e.g. a print in landscape format.

8.2 DXF Import

You may import DXF files while retaining most element attributes. In case some special items were included when the drawing was created with a CAD program, you may easily extend the FluidDRAW symbol library.

Depending on whether the entire drawing represents a single symbol or several symbols, you should comply with some grouping standards. When you select a DXF file to be opened, the DXF Import dialog box is displayed.

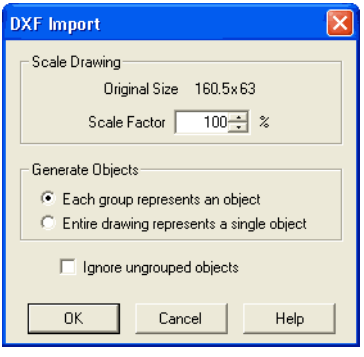

Figure 8/2: DXF import.

Scale factor

Defines the scaling factor (in percent), by which a file is to be imported.

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Each group represents an object	Select this option when your DXF drawing contains several symbols. FluidDRAW will only recognize that the elements of the various symbols belong together if you have grouped all symbols in your CAD program such that the outermost group of a symbol is contained in the ENTITIES section. This means that no two symbols must belong to the same group while there may be any number of groups and subgroups within one symbol. Also, different symbols may contain the same blocks. During import, FluidDRAW creates a new object for each block that doesn't belong to a parent block. You may then assign attributes to these objects, and define connections so that lines can be drawn.
Entire drawing represents a single object	This option applies to drawings which represent a single object. Independent of any groupings, all drawing elements are grouped into one new object. You may then assign attributes and define connections.
Ignore ungrouped objects	Use this option when you want to generate objects for grouped elements only. All elements in the ENTITIES section will be ignored. If this option is not active, FluidDRAW creates another object that consists of all ungrouped elements.

8.3 DXF Export

You may save FluidDRAW circuits as a DXF file to e. g. further process them with a CAD program. When you select File | DXF Export..., the system prompts you to select or enter a file name.

8.4 TIFF Export

The FluidDRAW circuits can be stored as TIFF-pictures e.g. in order to continue to process them with a program which is not vector-orientated. After having chosen the menu entry File | TIFF Export... you are requested to choose a file name or to enter a new one.

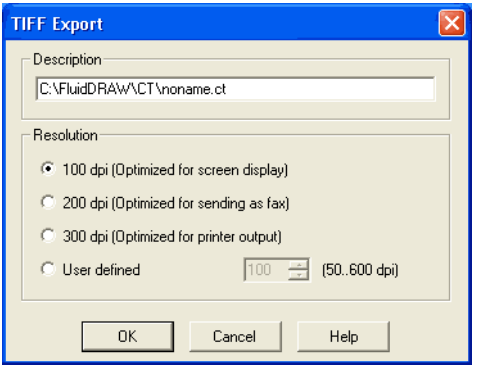

Figure 8/3: Export TIFF file.

Description

Please enter here an optional description. Normally the description that you have already entered under circuit properties is used. If there is no entry, the name of the circuit file is used.

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Resolution

Choose here a suitable resolution for the picture file. Please take into consideration that a high resolution can create very huge files and that it can take a rather long time to export them. However, you can stop the export of pictures at any time in case it takes too much time.

8.5 Exporting a Parts List

FluidDRAW not only allows you to print parts lists but also to export them to a text file.

Select exactly one parts list and select File | Parts List Export... .

This displays a dialog box where you can select a file or enter a new file name. When you exit the dialog box after entering a file name, you may choose a delimiter for columns.

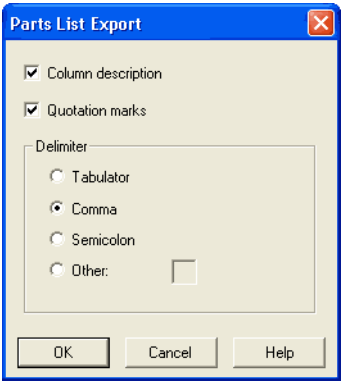

Figure 8/4: Parts list export.

Column description

If this option is activated, the descriptions of the attributes appear in the first row of the text file.

Quotation marks	With this option the field elements are put into quotation marks.
Delimiter	The selected delimiter is used to separate the items within a row.

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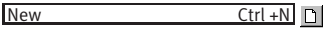
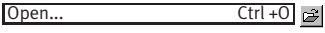
Menu Overview

Chapter 9

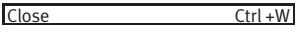
9.1 File



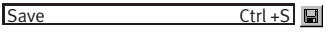
Opens a blank window where you can create a new circuit file.



Opens a dialog box where you can select a saved file. Files in DXF format are automatically converted to FluidDRAW circuits.



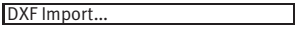
Closes the active (current) window.



Saves the circuit in the active (current) window to the data carrier.

Saves the circuit in the active (current) window under a different name to the data carrier.

Displays a preview of the FluidDRAW circuits on the data carrier. The circuit files reside in the `ct` subdirectory of the FluidDRAW directory.



Opens a dialog box where you can select a saved DXF file. Afterwards, the selected file is converted into a FluidDRAW circuit. The original file remains unchanged.

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DXF Export...

Saves the circuit in the current window as DXF file to the data carrier.

TIFF Export...

Saves the circuit in the current window as TIFF file to the data carrier.

Parts List Export...

Saves the contents of the selected parts list as text file to the data carrier.

Print... Ctrl +P

Opens the FluidDRAW Print File dialog box where you can set the print options for the active circuit.

Quit Alt+F4

Quits FluidDRAW.

9.2 Edit

Undo Alt+Backspace

Cancels the last action for the active circuit.

Redo Alt+Shift +Backspace

Cancels the last Undo action for the active circuit.

Cut Shift +Del

Cuts the selected objects and inserts them into the clipboard.

Copy Ctrl +Ins

Copies the selected objects to the clipboard.

Paste Shift +Ins

Takes the objects from the clipboard and inserts them into the active circuit.

Delete Del

Deletes the selected objects from the active circuit.

Select All Ctrl +A

Selects all objects of the active circuit.

Group

Groups the selected objects.

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Ungroup

Ungroups the selected groups.

Align

Aligns the selected objecs.

Rotate

Rotates the selected objects in steps of 90 degrees; objects are rotated anti-clockwise. Grouped objects are rotated around the center of the group frame.

Mirror

Mirrors the selected objects horizontally or vertically. Grouped objects are mirrored along the axis of the group frame.

Define Connection F2

Creates a new component connection when you click the line end of a symbol with the left mouse button.

Delete Connection

Deletes the selected component connection.

Properties...

Opens a dialog box where you can enter component properties. This option also allows you to retrieve attributes from the Festo product catalogue.

9.3 Circuit

Check Superficially F6

Checks the active circuit for drawing defects.

Drawing Size...

Opens a dialog box where you can set the drawing size.

Properties...

Opens a dialog box where you can enter circuit properties.

9.4 Library

All symbols

Shows a overview of the FluidDRAW symbols on the data carrier. The symbol files reside in the sub-directory `sym` of the FluidDRAW directory.

Frequently used symbols

Shows a overview of the FluidDRAW libraries on the data carrier. The library files are in the sub-directory `lib` of the FluidDRAW directory.

New...

Creates a new user-own library.

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Rename...

Opens a dialog box for the entry of the library properties.

Delete

Deletes the library including all symbols. In order to avoid that the standard symbols are deleted by mistake, only user-own libraries can be deleted.

9.5 Insert

From product catalogue / Quick search...

Opens the Festo product catalogue for a selection of a component via the part number.

From product catalogue / Component properties...

Opens the dki-propFesto product catalogue for a selection of a component from the product characteristics.

From product catalogue / Order list...

Opens the Festo product catalogue for the adoption of components from an existing order list.

Find Component... F3

Opens the search dialog for selecting a symbol.

9.6 Project

New...

Opens a dialog box where you can create a new project.

Open...

Opens a dialog box where you can select a saved project.

Close

Closes the active project.

Add current window

Adds the contents of the active (current) window to the file list for the open project.

Delete current window

Deletes the contents of the active (current) window from the file list for the open project.

Properties...

Opens a dialog box where you can enter project properties.

Circuit diagrams

Displays the list of circuit files for the active project. Clicking a menu item opens the corresponding file.

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Component libraries

Displays the list of overview windows for the active project. Clicking a menu item opens the corresponding directory window.

9.7 View

Standard Size

Displays the circuit in standard size.

Previous Window

Displays the previous circuit. This option allows you to switch between the current and the previous circuit.

Fit to Window

Fits the circuit to the window size so that the whole circuit is visible.

Zoom by Rubber Band

Determines the new view by a rectangle that changes its size while you move the cursor and keep the left mouse button pressed.

Zoom In

Enlarges the view of the circuit by one step. Two steps correspond to twice the magnifying factor.

Zoom Out

Reduces the view of the circuit by one step. Two steps correspond to half the magnifying factor.

Show connection descriptors

Shows or hides the connection descriptors for the component symbols.

Display Grid G

Shows a background grid in the active circuit window. Use the Options menu to set the grid parameters.

Layers...

Opens a dialog box where you can set the properties for the drawing layers.

Display Line Width

Shows the line widths on the screen analogous to the line widths used for printing. These line widths can be set individually for each labellinklayer-propdrawing layer.

Toolbar

Shows or hides the toolbar.

Status Bar

Shows or hides the status bar.

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9.8 Options

Grid...

Opens a dialog box where you can set parameters for the background grid.

Product catalogue...

Brings up a dialog box with options concerning the import of symbols from the product catalogue.

Protect Text Components

Prevents users from inadvertently deleting or moving text components.

Create Backup Files

Creates a backup file with extension bak when you save a circuit file.

Save Settings Now

Saves settings and window arrangements for the current (active) project.

Save Settings on Exit

Saves settings and window arrangements for the current (active) project when you exit FluidDRAW.

9.9 Window

Cascade Shift +F5

Arranges the windows such that they overlap.

Tile Horizontally

Arranges the windows underneath each other.

Tile Vertically Shift +F4

Arranges the windows side by side.

Arrange Icons

Arranges the window icons.

Window list...

Brings up a dialog box with currently opened windows.

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9.10 ?

Contents F1

Shows the contents of FluidDRAW help.

How to Use Help

Displays information on how to use help.

About FluidDRAW...

Displays information on the FluidDRAW program.

Functional diagram editor

Chapter 10

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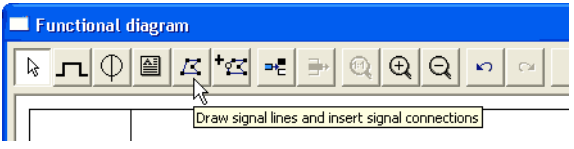
By dragging the window edges, the window can be resized. It is also possible to maximize the window.

The tool bar buttons are used to edit a functional diagram. With the following six buttons you can chose an operation mode.

- Edit mode
- Draw diagram curves
- Insert signal elements
- Insert text boxes
- Draw signal lines and insert signal connections
- insert additional nodes into signal lines

The chosen mode is pointed out in white. for example indicates that signal lines are drawn by clicking into the diagram area.

If the mouse pointer remains for more than one second on a button, a short description appears on the screen.



10.1 Edit mode

This mode is used to adjust the objects in the functional diagram. You can move elements in the diagram. The size of text boxes can be changed in this mode only.

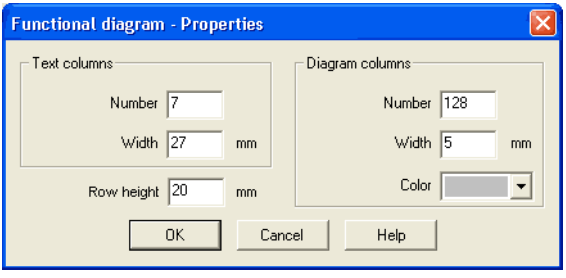
Move- and resize operations can be aborted with the Esc button.

If you move the mouse pointer out of the window area by keeping the left mouse button pressed, the view is scrolled automatically.

A double-click on a diagram element (diagram row, text, signal element, etc.) opens a dialog box where the requested adjustments can be made.

10.1.1 Set up diagram properties

A click on the button Properties... opens a dialog box in which you can set up the diagram properties.



Text columns – Number

If the number of the text columns is changed, all table's text boxes are distributed equally in a horizontal direction.

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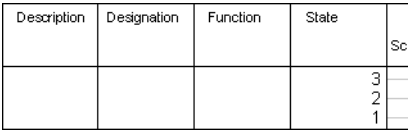
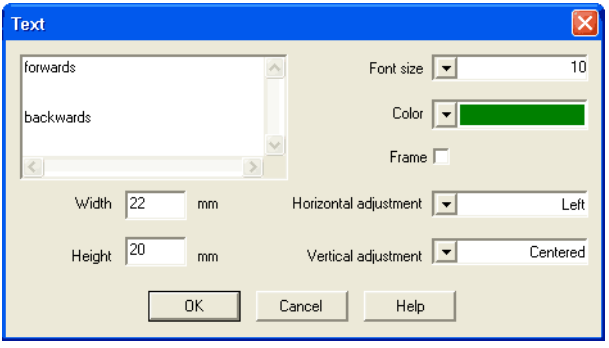
Text columns – Width	If the width of the text columns is changed, all table-text boxes are distributed equally in a horizontal direction.
Diagram columns – Number	The diagram columns are located on the right side of the functional diagram. In this area the diagram curves can be drawn. The number of diagram columns can also be changed by moving the mouse on the right margin of the diagram.
Diagram columns – Width	Color used for drawing the grid lines in the diagram area
Color	Determines the height of all rows.
Row height	

10.1.2 Table text boxes

On the left side of the functional diagram the table's text boxes are located.



A double-click on a table text box opens the corresponding dialog box.



Font size	Font size of the text to be represented
Color	Choice between sixteen standard colors for the text to be represented.
Width	The width of the table column you have chosen can also be changed by moving the mouse.
Height	The height of the table column you have chosen can also be changed by moving the mouse.
Horizontal adjustment	Following adjustments are available: “Left”, “Centered” and “Right”.
Vertical adjustment	Following adjustments are available: “Top”, “Centered” and “Bottom”
Table-like adjustment within a table cell	In order to get a table-like adjustment of text within a text box, tabulators are inserted between the separate parts of the text. The text is represented in the text box according to the number of tabulators and the defined horizontal and vertical adjustments. In order to set tabulators within a text field of a dialog box it is necessary to keep the Ctrl button pressed.

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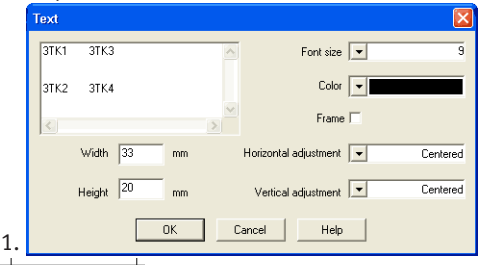
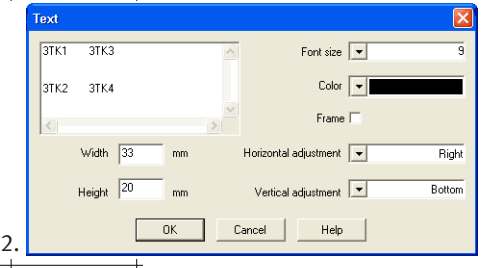
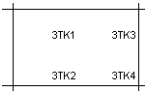
Examples:

1.



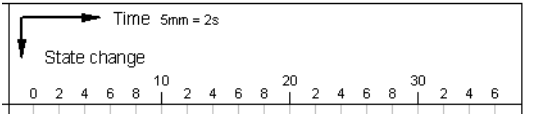
2.



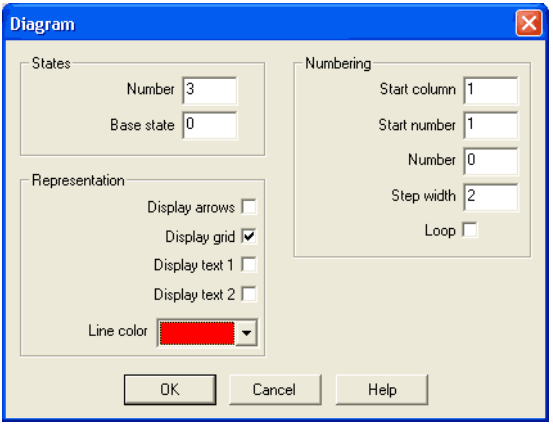


10.1.3 Adjust the representation of the diagrams

On the right side of a diagram row you can find the area in which the curves can be drawn.



A double-click on this area opens a corresponding dialog box.You can determine the appearance of the drawing area with it. Please make sure that there is no diagram element under the mouse like e.g. a signal element.



States – Number	The entry defines the number of states and by that the number of horizontal lines in the diagram row.
States – Base state	Horizontal lines through the base state are drawn with a thin pen.
Numbering – Start column	The start column indicates at which column the numbering is to begin.
Numbering – Start number	The start number indicates with which number the numbering is to begin.
Numbering – Number	The number indicates how many steps are to be numbered.
Numbering – Step width	Defines the step width between two numbers.
Numbering – Loop	If this field is marked, an equals sign and the start number display additionally after the last number.

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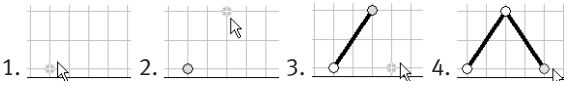
Representation – Display arrows	If this field is marked, two arrows display.
Representation – Display grid	If this field is marked, the background grid displays.
Representation – Display text 1	If this field is marked, a text box displays. It can be used for marking purposes. This text box belongs to the row you have chosen and cannot be shifted into another row.
Representation – Display text 2	If this field is marked, an additional text box displays. It can be used for marking purposes. This text box belongs to the row you have chosen and cannot be shifted into another row.
Representation – Line color	Defines the color of the diagram lines.

10.2 Draw diagram curve

In this mode you can draw the diagram curves. Nodes can only be inserted on the grid. Every left mouse click creates a new node.



If you keep the left mouse button pressed, nodes can be moved like in the edit mode.

Marked nodes are shown in grey color. With the Del button a marked node is deleted.

10.3 Insert signal elements

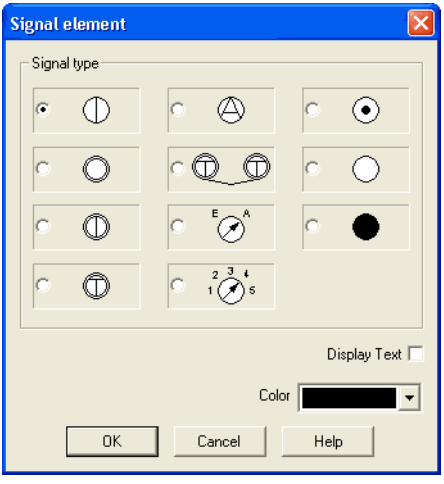
In this mode you can insert signal elements with a left-click.

1. 2.

If you keep the left mouse button pressed, signal elements can be moved like in the edit mode.

Marked signal elements are shown in grey color. With the Del button a marked signal element is deleted.

A double-click on a signal element in the edit mode opens a corresponding dialog box. You can adjust the representation of the signal element with it.



Signal type

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Display text	If this field is marked, a text which can be used to mark the signal element displays.
Color	This is the color showing the signal element.

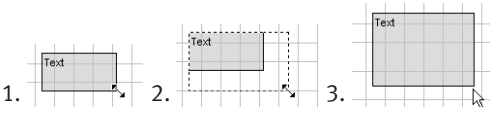
10.4 Insert text boxes

In this mode you can insert text boxes by a left mouse button click.

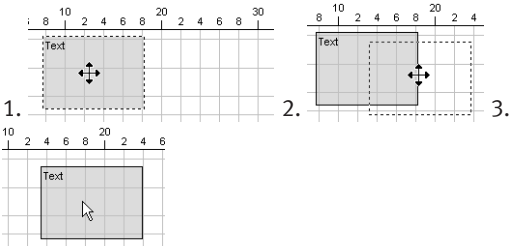
Marked text boxes are shown in grey color. With the Del button a marked text box is deleted.

In the edit mode the size and position of a text box can be changed with the mouse.

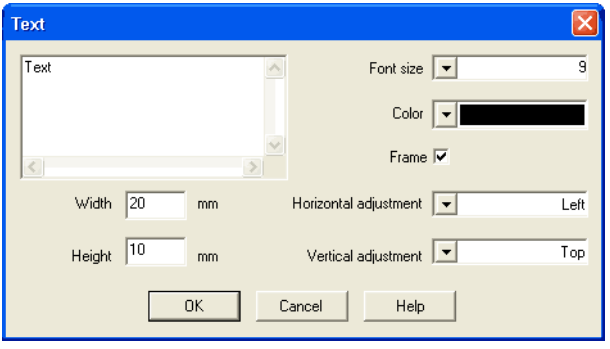
Adjust size:



Move text box:



A double-click on a text box in the edit mode opens a corresponding dialog box. You can adjust the representation of the text box with it.



Font size	Font size of the text to be represented.
Color	color Choice between sixteen standard colors for the text which can be represented.
Frame	If this field is marked, the text box is drawn with a frame.
Width	The width of the text box.
Height	The height of the text box.

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Horizontal adjustment	Following adjustments are available: “Left”, “Centered” and “Right”.
Vertical adjustment	Following adjustments are available: “Top”, “Centered” and “Bottom”

10.5 Draw signal lines and insert signal connections

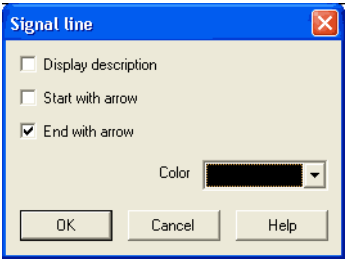
In this mode signal lines can be drawn arbitrarily or can be transferred automatically by signal elements.

10.5.1 Draw signal lines arbitrarily

Every left-click creates an additional node. You can stop this operation by clicking on the present line and keeping the Ctrl button pressed, by pressing the Esc button or by changing the operation mode. With the Del button a marked signal line is deleted. If only one node is marked, just this node is removed from the line.

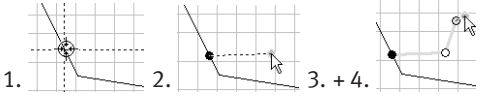
In the edit mode you can move the nodes of the signal lines. If you keep the Shift button pressed when you place or move nodes, the corresponding node is adjusted vertically and horizontally, respectively.

Change the representation of the lines in the edit mode with a double-click.



Display description	A framed description on the line and a description next to the framed description displays. The framed description can be moved freely on the line. The additional description can be moved freely.
Start with arrow	An arrow displays at the beginning of the line. The arrow can be moved freely on the line.
End with arrow	An arrow displays at the end of the line. The arrow can be moved freely on the line.
Color	line color

If you click on a finished signal line in the mode draw signal lines, a signal connection is inserted. This connection node can be moved freely on the line.



In the edit mode the representation of the signal connection can be changed by a double-click:

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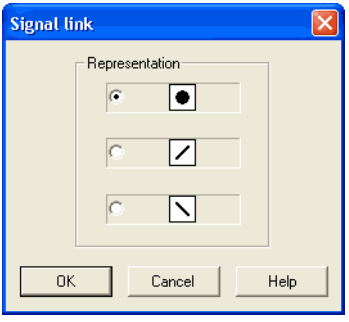
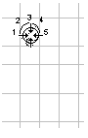
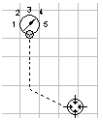
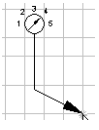


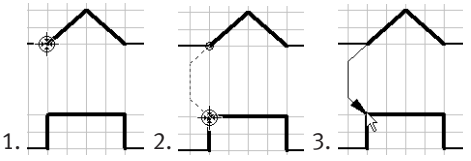
10.5.2 Draw signal lines from signals onwards

In the mode draw signal lines , signal lines can be drawn from signals onwards. Click with the left mouse button on a signal and keep the mouse button pressed. Move the mouse to a position which you have chosen as the end point of a signal line. After having released the mouse button, the signal line is being drawn.

1. 
2. 
3. 

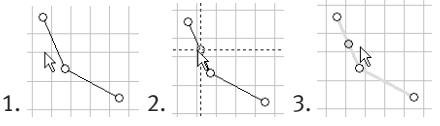
10.5.3 Draw signal lines from diagram-nodes onwards

In the mode draw signal lines , signal lines can be drawn from curve nodes onwards. Click with the left mouse button on a node and keep the mouse button pressed. Move the mouse on a second node. After having released the mouse button on top of the second node, the signal line is being drawn.



10.6 Insert additional nodes into signal lines

In the mode insert additional nodes into signal lines , additional nodes can be inserted into existing signal lines.



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10.7 Add row

By clicking on the button Add row , a new diagram row is inserted on top of the current selection. If there is no selection on a cell, a new line is added to the end of the diagram.

10.8 Delete row

By clicking on the button Delete row , a selected diagram row is deleted. If nothing is selected, the button is disabled.

10.9 Additional functions

10.9.1 Zoom

With the button 1:1 view the view is reset to the standard zoom level.

With the button the view is enlarged in size.

With the button the view is reduced in size.

10.9.2 Undo actions

With the button undo , you can undo the last 50 actions.

With the button redo , the actions you have undone before can be redone.

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Frequently Asked Questions

Chapter 11

?!

Question: Whenever I start FluidDRAW it comes up with the example drawing.
Answer: This is installation default setting. Arrange the windows the way you like to have for the future and select Options / Save Settings Now. If you want the windows settings to be saved on exit check the menu item Options / Save Settings on Exit.

?!

Question: How do I write a multi line text field?
Answer: Use CTRL+Return in the text editor

?!

Question: Can I use my "old" CAD drawings and symbols within FluidDRAW ?
Answer: Yes. The easiest way to do it is to open a drawing as a DXF file. To do so, open FluidDRAW, select File / Open, and select file type *.DXF.

?!

Question: How do I add connection points then?
Answer: Use Edit / Define Connection (F2), then click the line end where you want to create the new connection point.

?!

Question: How do I print the parts list for one ore more circuit diagrams on an extra sheet?
Answer: FluidDRAW allows you to have parts lists created automatically (Insert / Parts list). You may select the appropriate parts list component and insert, move or delete it just like any other symbol. When you insert a parts list, the program checks the existing components for attributes and creates a table. You may adjust the form and contents of the parts list to your requirements and export it as a text file.
The FluidDRAW project concept is used to print the parts list for a circuit on an extra sheet of paper:

- In addition to the circuit, open another file using File / New.
- Save the new file under an appropriate name using File / Save as...

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– Select Project / New... to define a new project and assign a name to the project.

– FluidDRAW automatically adds both open files to the new project.

– Move the parts list to the new file. Click the parts list with the right mouse button. When you select Properties, the Parts List dialog box opens where you can check the Include all project files check box to have the program list the components of all files which belong to the open project.

?!

Question: How do I draw a dashed line?
Answer: FluidDRAW allows you to insert a rectangle. When you make the rectangle so small so that its width or height equals 1, you may use the object as a line. If modifying the rectangle using the mouse is too difficult, double-click the rectangle to open the properties dialog box, and enter 1 into the appropriate field. You may change the length of the line as well as select the color and line style.

?!

Question: How do I permanently set the font and character size for texts?
Answer: That's easy! Open the Symbol Preview window and select Text, comments... Find the Text symbol, which you can open by double-clicking it. To define properties, double-click Text. Enter font, character size, color, and other parameters. When you close the file, your selections are saved as defaults. Important note: These settings default whenever you select the Text symbol.

?!

Question: I'd like to change the descriptions for predefined symbols.
Answer: Select Library / All Symbols and find the group that contains the symbol whose description you want to change. Double-click the symbol file. Mark (select) the symbol. Then, select Circuit / Properties... to open a dialogue box. Enter your own description into the Description field and save it.

?!

Question: I use other components in addition to Festo components. When I create a circuit, is it possible to assign "external" data to FluidDRAW symbols?
Answer: Yes. Let's suppose you have inserted a valve symbol into your circuit. Now, just double click the item and change the component attributes (parts no., type, etc.) This information automatically defaults to the parts list.

?!

Question: I want to store my drawings on a different folder/drive.
Answer: Edit the Festo.ini file (in your Windows directory) and add these entries to the section [Fluiddraw]

```
[Fluiddraw]
CT\_DIR=F:\backsl example
SYM\_DIR=F:\backsl example
LIB\_DIR=F:\backsl example
```

Now you will have the drawings (CT), symbols (SYM) and library (LIB) directories pointing to `F:\backsl example`

?!

Question: How to change the parts list table header text (example: use an English DKI but you want Dutch headlines)?
Answer: Create a file in the `\backsl MISC` directory with a file name `dki031.txt` with the following contents:

```
Article designation=Omschrijving
Product name=Productgroep
Packing unit=Aantal/verp.
Unit of quantity=Verp.eenh.
Price per PCS Price EUR=Prijs/comp -- EURO
Comment=Opmerking
```


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Chapter 12

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